Siyuan Tang (唐思远)

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Education

University of Science and Technology of China (USTC) Hefei, China

Bachelor of Science in Statistics Sep. 2021- Jun. 2025

- GPA: 4.00/4.3
- Weighted average: 91.8/100
- Ranking: 2nd in the Department of Statistics and Finance

Core course grades

Statistics:

- Nonparametric Statistics (100)
- Regression Analysis (100)
- Multivariate Analysis A (96)
- Categorical Data Analysis (100)
- Fundamentals of Statistical Algorithm (92)
- Machine Learning (92)
- Probability (95)
- Mathematical Statistics (90)
- Applied Statistical Software (90)
- Introduction to Deep Learning[1] (98)

Mathematics:

- Real Analysis (93)
- Complex Analysis[2] (90)
- Functional Analysis (91)
- Convex Optimization (92)
- Introduction to Differential Equations with Applications (90)
- Mathematical Analysis B1 and B2 (91 and 90)
- Linear Algebra B1 and B2 (90 and 90)

Physics[3]: Mechanics A (97), Thermotics A (90), Electromagnetism A (97)

Research Interests

Future statisticians should have the ability to conduct end-to-end research, from data collection and preprocessing to model development, goodness-of-fit assessments, performance evaluation, and ultimately, communicating findings in ways that are impactful for real-world applications.

Specifically, I wish to find statistical models which are both realistic and mathematically tractable, solving real-world problems with theoretical guarantees.

• High-dimensional statistics • Nonparametric statistics • Statistical network analysis

[1] An elective course for statistics undergraduates taught by the School of Artificial Intelligence and Data Science at USTC.

[2] In my official transcript, this course title is translated as "Complex Variable". However, the correct translation is "Complex Analysis".

[3] Although Siyuan Tang's major is statistics, he has taken some physics courses designed for physics undergraduates. They are included here because physics courses typically require advanced mathematical skills.

Research Experiences

Analyzing Flare Dependency Structure via Hierarchical Hidden Markov Models
(Ongoing) Jan. 2025 - Present
Advisor: Assistant Professor Yang Chen (Department of Statistics, University of Michigan)

- Designed and implemented Bayesian hierarchical Hidden Markov Models, assuming a shared observation matrix and initial state distribution across all trajectories, while allowing sample-specific variations in the state transition matrix.
- Performed posterior inference via Gibbs MCMC sampling from scratch.

A Novel Approach to Solar Flare Forecasting: Energy-Based Prediction and Classification Using SHARP[4] Parameters [Paper in Preparation] Jul. 2024 - Dec. 2025
Advisor: Assistant Professor Yang Chen (Department of Statistics, University of Michigan)

- Developed a data-driven modeling strategy for flare trajectories and performed goodness-of-fit assessments, including tests of correlation and normality.
- Proposed an energy-based identification method, achieving improved classification performance measured by the True Skill Statistic for strong flare events.
- Transformed the two-step framework (energy regression + threshold optimization) into a one-step approach by using a sigmoid function to approximate the indicator function.

Minimum Variance Portfolio (MVP) Estimation with Sparsity Mar. 2023 - Sep. 2023
Advisor: Associate Professor Bo Zhang (Department of Statistics and Finance, USTC)

- Learned a polynomial-time algorithm for best-subset selection problem from an existing paper.
- Developed a new algorithm to fit into the MVP problem with a given support size, and implemented it in R using parallel computing.
- Compared the predicted risk and actual risk and explored the effectiveness in both low and high dimensions.

Skills

Programming: Python, R, C
Typesetting: LaTeX, Markdown

Language

TOEFL: Total 103 (Reading 25, Listening 28, Speaking 24, Writing 26)
GRE general: Verbal 153 (55%) + Quantitative 170 (92%) + Analytical Writing 3.0 (16%)

Honors and Awards

Outstanding Student Scholarship 3 times (2022, 2023, and 2024)

[4]SHARP stands for Space-weather Helioseismic and Magnetic Imager Active Region Patches, a dataset used in solar physics.